Page 14, line 5, after "lead" insert --14--.

Page 14, line 10, after "thermocycler" insert --15--.

Page 14, line 15, after "source" insert --16--.

Page 14, line 29, after "cap" insert --17--.

IN THE CLAIMS:

Please cancel claims 23-29 without prejudice or disclaimer of subject matter.

Please add the following new claims 30-47:

--30. An instrument for monitoring a nucleic acid amplification reaction over multiple thermal cycles, comprising:

(a) a thermal cycler capable of alternately heating and cooling, and adapted to receive, a reaction vessel containing an amplification reaction mixture comprising a target nucleic acid, reagents for nucleic acid amplification, and a detectable nucleic acid binding agent, in a sealed vessel condition; and

(b) an optical system including a detector operable to detect an optical signal related to the amount of amplified nucleic acid in the reaction vessel over a multiple-cycle period, with the reaction vessel in a sealed condition, allowing determination of a cycle-dependent change in such optical signal over a multiple-cycle period with the reaction vessel in its sealed condition.

31. The instrument of claim 30, wherein the thermal cycler is capable of alternately heating and cooling, and adapted to receive, a plurality of reaction vessels, each containing an amplification reaction mixture.

32. The instrument of claim 30, wherein the detector, in detecting the optical signal, is operable to sample optical signal values over multiple thermal cycles.

33. The instrument of claim 30, wherein the detector is operable to distinguish the detected optical signal from any other optical signals originating in the reaction vessel.

34. The instrument of claim 30, wherein the detector is operable to detect a fluorescence optical signal.

35. The instrument of claim 30, wherein the detector is operable to detect a fluorescence optical signal at a wavelength at or about 570 nm.

36. The instrument of claim 30, wherein the optical system includes a sealed transmission path.

37. The instrument of claim 36, wherein the sealed light transmission path is a fiber optic cable.

38. The instrument of claim 30, wherein the thermal cycler is computer-controlled.

39. A system for monitoring a nucleic acid amplification reaction over multiple thermal cycles, comprising:

(a) a reaction vessel adapted to contain an amplification reaction mixture comprising a target nucleic acid, reagents for nucleic acid amplification, and a detectable nucleic acid binding agent, in a sealed vessel condition;

(b) a thermal cycler capable of alternately heating and cooling such a reaction vessel; and

(c) an optical system including a detector operable to detect an optical signal related to the amount of amplified nucleic acid in the reaction vessel over a multiple-cycle

period, with the reaction vessel in a sealed condition, allowing determination of a cycle-dependent change in such optical signal over a multiple-cycle period with the reaction vessel in its sealed condition.

40. The system of claim 39, wherein the instrument comprises a plurality of reaction vessels, each adapted to contain an amplification reaction mixture.

41. The system of claim 39, wherein the detector, in detecting the optical signal, is operable to sample optical signal values over multiple thermal cycles.

42. The system of claim 39, wherein the detector is operable to distinguish the detected optical signal from any other optical signals originating in the reaction vessel.

43. The system of claim 39, wherein the detector is operable to detect a fluorescence optical signal.

44. The system of claim 39, wherein the detector is operable to detect a fluorescence optical signal at a wavelength at or about 570 nm.

45. The system of claim 39, wherein the reaction vessel includes a clear or translucent cap optically coupled to the detector by a sealed light transmission path.

46. The system of claim 45, wherein the sealed light transmission path is a fiber optic cable.